

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number
WO 2005/064365 A1

(51) International Patent Classification⁷: **G02B 5/20**, H01S 5/00

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/EP2003/014917

(22) International Filing Date:
24 December 2003 (24.12.2003)

(25) Filing Language: English

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(26) Publication Language: English

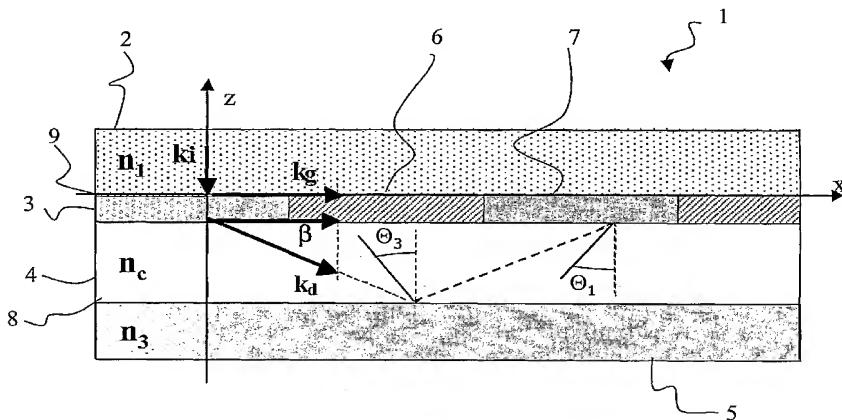
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(54) Title: TUNABLE RESONANT GRATING FILTERS



(57) **Abstract:** The invention relates to a tunable resonant grating filter that can reflect optical radiation at a resonant wavelength, said resonant wavelength being selectively variable. The filter comprises a diffraction grating (3), a planar waveguide (4) and a light transmissive material having a selectively variable refractive index to permit tuning of the filter, said light transmissive material forming a tunable cladding layer (5) for the waveguide, preferably a liquid crystal (LC) material. The diffraction grating (3) is placed on the opposite side of the tunable layer (5) with respect to the planar waveguide (4) thereby making possible to tailor the grating structural parameters to the desired bandwidth of the filter response without significantly affecting the tunability of the filter. Within the resonant structure (1) of the present invention, the core layer, i.e., the waveguide (4), can be placed close to the tunable layer (5), either in direct contact with the tunable layer or with an interposed relatively thin intermediate layer(s) between the core and the tunable layer. Proximity of the core layer (4) to the tunable layer (5) implies that the propagation mode can significantly extend into the tunable layer (5) so that the effective refractive index of the fundamental mode in the waveguide (4) is efficiently affected by variations of the refractive index of the tunable layer (5).



SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UC, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

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